

Amendments to the Claims

JC17 Rec'd PCT/PTO 09 JUN 2005

The following listing of the claims replaces all previous listings and versions of the claims in the application:

5 Listing of the Claims

1. (currently amended) An encapsulated electronic device, comprising;  
a first laminar electrode,  
a second laminar electrode,  
an element of electronically active material sandwiched between said first laminar elec-  
10 trode and said second laminar electrode,  
a region of insulating material enclosing said first laminar electrode said second laminar  
electrode and said element of active material, wherein said region of insulating material  
comprises a first layer of insulating material covering the first laminar electrode and a  
second layer of insulating material covering the second laminar electrode,  
15 a first terminal for facilitating an external electrical connection to the first laminar elec-  
trode,  
a second terminal for facilitating an external electrical connection to the second laminar  
electrode,  
a first conductive interconnection that passes through the ~~region of~~ first layer of insulat-  
20 ing material to electrically connect the first terminal and the first laminar electrode,  
a second conductive interconnection that passes through the ~~region of~~ second layer of  
insulating material to electrically connect the second terminal and the second laminar  
electrode, and  
~~wherein at least one of said first conductive interconnections and second conductive in-~~  
25 ~~terconnections comprises a metal plating~~ further comprising a third terminal located on  
the same side of the device as the first terminal and electrically connected to the second  
terminal by a first electrical connection formed between opposing sides of the device  
through said region of insulating material such that the first electrical connection is in-  
ulated from the element of active material.  
30
2. (original) An encapsulated electronic device according to claim 1, wherein said first  
conductive interconnections and second conductive interconnections both comprise  
metal plating.

3. (original) An encapsulated electronic device according to claim 1, wherein said electronic device is a leaded device having a first lead affixed to said first terminal and a second lead is affixed to said second terminal.

5 4. (cancelled)

5. (currently amended) An encapsulated electronic device according to claim ~~[[4]]~~ 1, wherein said first electrical connection comprises a plated through hole via.

10 6. (currently amended) An encapsulated electronic device according to claim ~~[[4]]~~ 1, wherein said device is a leaded device having a first lead affixed to said first terminal and a second lead affixed to said third terminal.

15 7. (currently amended) An encapsulated electronic device according to claim ~~[[4]]~~ 1, wherein said device is a surface mountable device and said first and third terminals provide SMT connections.

20 8. (currently amended) An encapsulated electronic device according to claim ~~[[4]]~~ 1, wherein said device comprises a fourth terminal located on the same side of the device as the second terminal and electrically connected to the first terminal by a second electrical connection formed between opposing sides of the device through said region of insulating material.

25 9. (original) An encapsulated electronic device according to claim 8, wherein said second electrical connection comprises a plated through hole via.

Claims 10-11: (cancelled)

30 12. (currently amended) An encapsulated electronic device according to claim ~~11~~ 1, wherein said region of insulating material comprises a printed circuit board material having an aperture defined therein in which said element of active material is received.

13. (original) An encapsulated electronic device according to claim 1, wherein said active material is a positive temperature coefficient material.

14. (original) An encapsulated electronic device according to claim 13, wherein said positive temperature coefficient material is a polymeric material.

Claims 15-16: (cancelled)

17. (currently amended) An encapsulated [[PTC]] electronic device according to claim [[16]] 12, wherein the circuit board material is a laminate structure of glass or aramid fibers bonded with a resin material.

18. (currently amended) An encapsulated [[PTC]] electronic device according to claim [[15]] 1, wherein the first and second layers of insulating material are provided as layers of resin.

19. (cancelled)

20. (currently amended) An encapsulated [[PTC]] electronic device according to claim [[15]] 1, wherein said [[PTC]] device is a leaded device and wherein leads are fixed to the first and second third terminals.

21. (currently amended) A battery strap comprising at least one encapsulated [[PTC]] electronic device according to claim 20.

Claims 22-27: (cancelled)

28. (currently amended) An encapsulated [[PTC]] electronic device according to claim [[26]] 8, wherein the first, second, third and fourth terminals are suitably disposed to provide a symmetrical device.

29. (currently amended) An encapsulated [[PTC]] electronic device according to claim [[15]] 28, wherein the terminals are metal plated.

30. (currently amended) An encapsulated [[PTC]] electronic device according to claim 29 wherein the metal plating is a combination of copper, nickel and/or gold.
- 5 31. (currently amended) An encapsulated [[PTC]] electronic device according to claim 30 wherein the plating comprises three separate metal plates of copper, nickel and gold.
32. (currently amended) A method of manufacturing an electronic device, comprising the steps of:
- 10 (a) providing an element of electronically active material having a first metal layer as a first laminar electrode and a second metal layer as a second laminar electrode, (b) surrounding the first laminar electrode, the second laminar electrode and the segment element of electronically active material with a region of insulating material,
- 15 (c) providing a first terminal for facilitating an external electrical connection to the first laminar electrode, said step comprising the steps of covering said first laminar electrode with a first layer of insulating material and covering said second laminar electrode with a second layer of insulating material,
- (d) providing a second terminal for facilitating an external electrical connection to the second laminar electrode,
- 20 (e) creating a first opening through the region of insulating material,
- (f) providing a conductive path in said first opening to electrically connect the first terminal and the first laminar electrode, [[and]]
- (g) creating a second opening through the region of insulating material,
- (h) providing a conductive path in said second opening to electrically connect the second terminal and the second laminar electrode, and
- 25 (i) providing a third terminal on the same side of the device as the first terminal, and electrically connecting the third terminal to the second terminal using a first electrical connection formed between opposing sides of the device through said region of insulating material.
- 30 33. (original) A method of manufacturing an electronic device according to claim 32, wherein said step of surrounding the first laminar electrode, the second laminar electrode and the segment of electronically active material with a region of insulating material comprises the steps of placing the element of active material into an aperture de-

fined in a printed circuit board material.

34. (original) A method of manufacturing an electronic device according to claim 32, comprising the additional steps of fixing a first lead affixed to said first terminal and a second lead to the second terminal.

35. (cancelled)

36. (currently amended) A method of manufacturing an electronic device according to claim ~~[[35]]~~ 32, wherein said step of electrically connecting the third terminal to the second terminal is implemented by metal plating.

37. (currently amended) A method of manufacturing an electronic device according to claim ~~[[35]]~~ 32, comprising the additional steps of fixing a first lead affixed to said first terminal and a second lead to the third terminal.

38. (currently amended) A method of manufacturing an electronic device according to claim ~~[[35]]~~ 32, comprising the additional steps of:  
providing a fourth terminal located on the same side of the device to the second terminal,  
and electrically connecting the fourth terminal to the first terminal using a second electrical connection formed between opposing sides of the device through said region of insulating material.

39. (original) A method of manufacturing an electronic device according to claim 38, wherein said step of electrically connecting the fourth terminal to the first terminal using is implemented by metal plating.

Claims 40-41: (cancelled)

42. (original) A method of manufacturing an electronic device according to claim 32, wherein said active material is a positive temperature coefficient material.

43. (original) A method of manufacturing an electronic device according to claim 42, wherein said positive temperature coefficient material is a polymeric material.

44. (currently amended) A method of manufacturing an ~~encapsulated PTC~~ electronic device according to claim 32, wherein the step of surrounding the first laminar electrode, the second laminar electrode and the element of electronically active material with a region of insulating material comprises ~~comprising the steps~~ step of surrounding the circumference of an ~~element of PTC~~ the element of electronically active material with a segment of insulating material;

providing said ~~element of PTC material with a first laminar electrode substantially covering a first side of the PTC element,~~

providing said ~~element of PTC material with a second laminar electrode substantially covering a second side of the PTC element,~~

forming a first layer of insulating material substantially covering the first electrode;

forming a second layer of insulating material substantially covering the second electrode;

providing a first terminal for facilitating a external electrical connection to the first laminar electrode;

providing a second terminal for facilitating an external electrical connection to the second electrode;

forming an electrical connection between the first terminal and the first electrode through said first insulating layer; and

~~forming an electrical connection between the second terminal and the second electrode through said second insulating layer.~~

45. (currently amended) A method of manufacturing an ~~encapsulated PTC~~ an electronic device according to claim 44, wherein the segment of insulating material comprises circuit board material.

46. (currently amended) A method of manufacturing an ~~encapsulated PTC~~ an electronic device according to claim ~~[[44]]~~ 45, wherein the circuit board material is a laminate structure of glass or aramid fibers bonded with a resin material.

47. (currently amended) A method of manufacturing ~~an encapsulated PTC~~ an electronic device according to claim ~~[[44]]~~ 32, wherein the first and second layers of insulating material are provided as layers of resin.

5 Claims 48-54: (cancelled)

55. (currently amended) A method of manufacturing ~~an encapsulated PTC~~ an electronic device according to claim ~~[[53]]~~ 38, wherein the first, second, third and fourth terminals are positioned to provide a symmetrical device.

10

Claims 56-88: (cancelled)